ance of the latter bacillus in analytical work is not considered at all. In fact, the whole chapter on typhoid fever, while omitting all that is wanted, contains nothing worth reading. Instead of reading page after page of diseases of deer, buffalo, boars, swine, fowls, horses, cows, ducks, grouse, mice, rats and other animals, the student would have preferred a serious discussion of the present position of the cholera or diphtheria question. The yeasts and moulds are also unsatisfactorily treated, and there again we cannot get away from cows, calves, fowls and mice, while man is of quite secondary importance. A few pages are devoted to the hæmatozoa, and here also the malaria parasite which occurs in man comes off badly, while the parasites of surra, of the common rat, and of fish are much more fully discussed. There is, of course, much regarding small-pox, cow-pox and other pox in the book, and also, for some reason or another, lengthy extracts from the final Report of the Vaccination Commission. All this is unsatisfactory reading, because the author does not write impartially on this matter.

In conclusion, we must say that the book, although well got-up, is not one which can be considered as worthy of English bacteriology. The best parts in the book are some of the illustrations of animal diseases; but even as a picture-book it is unsatisfactory, for some drawings are too diagrammatic and on an excessive scale. The absence of sound criticism, the lack of a just sense of proportion, and the want of a true appreciation of the problems of disease, and more especially of human disease, compel us to speak severely of the work, and to warn the student of bacteriology, who is needs surrounded by doubt and dogma, against placing his confidence in such a guide. A. A. KANTHACK.

PREHISTORIC MAN AND BEAST.

Prehistoric Man and Beast. By the Rev. H. N. Hutchinson, B.A., F.G.S. Pp. xxii + 298. (London: Smith, Elder, and Co., 1896.)

THE unscientific reader cannot fail to find much that is instructive in this work; it brings into a comparatively narrow compass information which could only otherwise be obtained by a wide course of reading, and it makes good its pretension to be fairly well abreast of the times.

There are many "good things" in it, generally distinguished by inverted commas. The author has the true instinct of a writer for the populace, and steadily pursues effect: to a striking passage he will succumb, even if it be a trifle meretricious, and it will be found inserted in its due place, with an apology if necessary. Witness the long extract giving "a rather fanciful picture" of palæolithic man" (pp. 34-36).

Naturally he has little sympathy with the technical details on which scientific results depend. "Every work dealing with prehistoric man contains," he says, "long and tedious descriptions of the famous skulls . . ." (p. 75). No doubt, yet we fancy there is more than one place in this work where a familiar knowledge of these details would have proved useful to the author. Again, on p. 22, we find "detailed evidence from sections in gravel-pits, &c. (*sic*), such as would be almost unintelligible, with the probable result that he would lay down the book at once." The detailed evidence was probably omitted in this case with judgment, but there are others in which some knowledge of "sections" would have greatly assisted the reader, and might possibly have saved the author from the following. "First of all stone was used. . . . *Hence* the stone age is the earliest." (The italics are ours.) On a question of fundamental importance, like the order of succession of the different prehistoric periods, the reader is likely to require evidence of a different nature to this.

The impatience for all that is technical savours of ingratitude when the author, speaking of those original investigators who have provided him with so much valuable material, remarks of them that they "have so obscured the romance by their 'dry-as-dust' descriptions and ponderous reports of their labours, that no ordinary reader would care to plod through a single chapter of their writings." Probably these writers were too solicitous about the truth to care much about the romance, which for the present may be left in the care of the author, who, let us hasten to add, is not always so censorious as these extracts might suggest; he praises the artist who has embellished his work with fancy pictures, and he praises Sir Henry Howorth, who generously returns the compliment.

It is a pity the book is not better illustrated; several sketchy drawings, spoken of as "restorations," occupy some ten plates, but of figures of real interest there are none. The ordinary reader would have welcomed reproductions of palæolithic drawings, and figures of ancient weapons; maps would have assisted him, and even geological sections might not have come amiss. Of the plates, some are worse than others. It will, perhaps, be fairest to choose the frontispiece for comment. It represents a palæolithic family receiving a call, at the photographed entrance of Wookey Hole, from three different kinds of wild beast. One, which we took to be a polar bear, we are informed is a machairodus; the next, a very stuffed-looking specimen, is a cave bear; and the third, a hyæna. The author recognises that a triple alliance of this kind is improbable; why, then, does he represent it? Because—and here we find the true popular writer—"it makes a more interesting picture," and "scientific accuracy should not be pushed too far." We let this pass, as well as the toy harpoon with which the cave man is defending his weeping wife and family, to ask if the author really supposes that palæolithic man is fairly represented by the tall, fair Caucasian with long straight nose, and orthognathous jaws, who does duty for him here.

It may be that this is, as the author claims for the illustrations, "a thoroughly artistic and vivid picture," though it is more than doubtful whether it "would well bear reproduction on a larger scale"; but we are in cordial agreement with him when he remarks that it is not a scientific, "mere scientific" diagram, and—we should prefer the diagram.

We are not quite sure whether the author has any really clear ideas of the bodily aspect of the people he wishes to portray. In speaking of the stage of culture of

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palæolithic man, he makes use of Mr. Tylor's comparison with the aborigines of Tasmania; but on p. 36 we find the following: "In speaking of the probable mental and moral condition of man in the older stone age, we have, for want of further material, compared him with the aborigines of Australia, Tasmania, and New Zealand." Next time the author visits the British Museum, he will, perhaps, take a glance at the weapons and other implements of the Maoris that are exhibited there, and reconsider the evidence on which he regards these people as useful for purposes of comparison with men of the palæolithic age.

There is a great deal of foolish writing—there is no other term for it—in Chapter iv. headed "The Myth of the Great Ice-Sheet." The author concludes a tiresome tirade by admitting an ice-sheet, formed of confluent glaciers, which covered the greater part of the British Isles; he calls it a "modest local or British ice-sheet." With this conclusion in view, we might well have been spared the vapourings on "superstition," "bugbears," "myths," "nightmares," and the like—terms culled apparently from Sir Henry Howorth's vocabulary—as well as the somewhat spiteful gossip about Agassiz and Schimper. More modesty might have been expected from a popular writer; we shall not imitate Mr. Hutchinson's style, and say a mere popular writer—it would be rude—in discussing the views of some of the great geologists of the past. To speak of Ramsay, Agassiz, and Croll as having "gone mad over ice," as prostrating before it "not only their bodies, but their minds," and as having been beyond the reach of reason, is not becoming: still worse is the expression that Croll misled the public. Croll requires no defence from us, and we make no further comment.

The author appears as a reconciler of Genesis and science, with a somewhat inadequate acquaintance with Babylonian writings; the same deficiency appears in the ten pages devoted to the question of the origin of the zodiacal signs. He was warned of the doubtful nature of Mr. Peck's theory by Mr. Flinders Petrie, but introduces it with the usual plea—it may be wrong, but it is "interesting." There is an extensive literature on the origin of the zodiacal signs, and the probabilities all point to Babylonia as their birthplace.

As for the literary style of the book, it is well enough so long as the author keeps to digests, summaries, and simple descriptions; but where he gives us something of his own, the result is less pleasing. We could well have dispensed with several feeble witticisms, a parade of puerile suggestions, and a good deal of sentiment. As an instance of the author's undiluted style, we quote the following:—

> "How delighted must Mr. Ruskin and all true followers of our great teacher and prophet be to learn that, after all, we shall not have to give up our fairies! And what an anti-climax must such a result appear to those hard, unsentimental scientific workers and thinkers who were wont to consider fairy tales as nothing but pure 'stuff and nonsense'! It must be somewhat humiliating to such—if there be any left—to reflect that they must no longer dare to despise fairies, but are compelled, in the sacred name of Science (with a *very* big S), to pay homage to them!"

W. J. SOLLAS.

OUR BOOK SHELF.

Getting Gold: a Practical Treatise for Prospectors, Miners, and Students. By J. C. F. Johnson, F.G.S., Member of the Aust. Inst. of Mining Engineers, Pp. xii + 204. (London: Charles Griffin and Co., Ltd., 1897.)

IN this book will be found much practical information on the mining and subsequent treatment of gold ores, particularly useful to the prospector setting out for Australia. It has often been said that the practical man does not write books, but there is here a complete refutation of the calumny. There are chapters on the "genesiology" of gold, which are hardly of practical value, on the treatment of ores by various processes, and on company formation. A useful section, too, is devoted to prospecting, in which the various difficulties of finding gold are clearly set forth. "Where it is, there it is," the author quotes, "and where it is, generally, there I ain't." The best part of the book, however, is undoubtedly under the heading of the "Rules of Thumb." Here the practical man shows what he can do. The recipes given are absolutely encyclopædic, and all more or less to the point. We are told how to make fire, how to find water, how to purify it and carry it, how to copy correspondence, to cross a flooded stream, and to build a house. One is lost in admiration at the wealth of knowledge displayed, and the mixture of "cuteness" and simplicity in the remarks.

The tables at the end of the book are less happy. A dozen or more mistakes occur in a short table of fusing and boiling points, and the elementary algebra seems unnecessary in the present state of primary education. Nevertheless, though not without faults, the book will be most useful to prospectors who have not been through a course of study at a School of Mines

Photo-Trichromatic Printing By C. G. Zander. (Raithby, Lawrence, and Co., Ltd., 1896.)

THIS book is a model of neatness and printing, and harmonises well with the subject of which it treats. The author has not attempted an elaborate text-book on the optical sciences of chromatics and spectroscopy, but states in a straightforward and clear manner the outlines of the causes of colour phenomena and the effects of pigmentary mixtures and combinations. A perusal of the fifty pages shows that Mr. Zander has adopted a very happy arrangement for the sequence of the matter dealt with, making the book easy reading for even those who are not very familiar with the subject.

The first of the four parts into which the book is divided treats of chromatics and, more briefly, spectroscopy, the reader being introduced to the three fundamental colour sensations. In Part ii. pigment mixtures are discussed, and many a useful hint may be gathered here by those who wish to know the why and the wherefore of common every-day manipulations. The explanatory diagrams showing the absorption of two typical pigments and those of the resulting mixtures are all that could be desired. A useful *aide-mémoire* is the chromatic clock-dial, which is an ingenious idea for helping those who work with colours to remember which are the contrast or complementary colours, and how saddened colours or tints may be produced.

Three-colour work, or the production of any colour by the combination of the three primary colour sensations, is treated of in the third part.

The concluding section is devoted to the important question of photochromic printing inks, the author pointing out the chief essential qualities that they must possess for successful work.

We may say, in conclusion, that printers and artists have in these few pages a useful handy guide, which will give them an insight into the art of successful photochromic three-colour printing.

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